4.9 AIR QUALITY

This section addresses project impacts upon ambient air quality, and the exposure of people (especially sensitive individuals) to unhealthy pollutant concentrations. Air pollutants of concern for the western Placer County area include ozone (O3), carbon monoxide (CO), and particulate matter (PM-10). This section analyzes the type and quantity of emissions that would be generated by construction and operation of the proposed project.

4.9.1 SETTING

CLIMATE

Air quality is affected by the rate, amount, and location of pollutant emissions and the associated meteorological conditions that influence pollutant movement and dispersal. Atmospheric conditions including wind speed, wind direction, and air temperature, in combination with local surface topography (i.e., geographic features such as mountains and valleys) determine the effect of air pollutant emissions on local air quality.

The proposed project is located in the western part of Placer County, which lies within the Sacramento Valley Air Basin (Sacramento Valley). The climate of the Sacramento Valley is Mediterranean in character, with mild, rainy winter weather from November through March and warm to hot, dry weather from May through September. The geographic features giving shape to the Sacramento valley are the Coast Range to the west, the Sierra Nevada to the east, and the Cascade Range to the north. These mountain ranges channel winds through the Sacramento Valley but also inhibit dispersion of pollutant emissions.

The Sacramento Valley is subject to eight unique wind patterns. The predominant annual and summer wind pattern is the Full Sea Breeze, commonly referred to as Delta Breezes (California Air Resources Board [CARB], 1984). These cool winds originate from the Pacific Ocean and flow through a sea-level gap in the Coast Range called the Carquinez Straits. In the winter season (December-February), northerly winds predominate (CARB, 1984). Wind direction in the Sacramento Valley is influenced by the predominant wind flow pattern associated with the season.

The vertical and horizontal movement of air is an important atmospheric component involved in the dispersion and subsequent dilution of air pollutants. Without movement, air pollutants can collect and concentrate in a single area, increasing associated health hazards. For instance, in the winter months, the Sacramento Valley typically experiences calm atmospheric conditions. These calm conditions result in stagnation of Valley air and increased air pollution. As a result, persistent inversions occur frequently in the Sacramento Valley, especially during late fall and early spring and act to restrict vertical dispersion of pollutants released near ground level.

AIR QUALITY PLANS, POLICIES, AND STANDARDS

The Federal Clean Air Act (FCAA) requires the U.S. Environmental Protection Agency (EPA) to identify National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. National standards have been established for six air pollutants, including ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), suspended particulate matter (PM-10), and lead (Pb). These pollutants are called "criteria" air pollutants because standards have been established for each of them to meet specific public health and welfare criteria.

Similarly, the state of California enacted the California Clean Air Act (CCAA), establishing more stringent State Ambient Air Quality Standards (SAAQS) for the six criteria air pollutants described above as well as vinyl chloride, sulfates, visibility reducing particles, and hydrogen sulfide. Both national and state ambient air quality standards for these pollutants are listed in **Table 4.9-1**. These ambient standards represent the levels of air quality necessary, with an adequate margin of safety, to protect human health and welfare.

Under amendments to the federal Clean Air Act, EPA has classified air basins (or portions thereof) as either "attainment" or "non-attainment" for each criteria pollutant, based on whether or not the national standards have been achieved. The 1988 CCAA, which is patterned after the federal Clean Air Act, also requires areas to be designated as "attainment' or 'non-attainment" with respect to state standards. Thus areas in California have two sets of designations: one with respect to the national standards and one with respect to the state standards.

The proposed project lies within western Placer County, which is a part of the multi-county region referred to as the Sacramento Federal Ozone Nonattainment Area (SFONA). The nonattainment area has been designated "severe" non-attainment for the national one-hour average ozone standard. Sacramento Valley Air Basin as a whole, including a portion of Placer County, is also designated "non-attainment" for state standards for ozone and PM-10 (CARB, 2003a). The western part of Placer County is "attainment" or "unclassified" with respect to other ambient air quality standards.

The Federal Clean Air Act requires areas designated as non-attainment to prepare air quality plans that include strategies to achieve attainment. Air quality plans prepared to meet federal requirements are referred to as State Implementation Plans (SIPs). The CCAA also requires that air districts prepare an air quality attainment plan for areas designated as non-attainment with respect to the state standards, if the district violates state air quality standards for CO, sulfur dioxide (SO_2), NOx, or ozone. The CCAA requires that the state air quality standards be met as expeditiously as practicable, but it does not set precise attainment deadlines. Instead, the act established increasingly stringent requirements for areas that will require more time to achieve the standards. The least stringent requirements were set for areas

TABLE 4.9-1
STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards [a]	Federal Standards [b]
Ozone (O3)	1 Hour	0.09 ppm [c]	0.12 ppm
	8 Hour	—	0.08 ppm
Respirable Particulate Matter (PM-10)	24 Hour	50 µg/m^3 [c]	150 µg/m^3
	Annual Arithmetic Mean	20 µg/m^3	50 µg/m^3
Fine Particulate Matter (PM-2.5)	24 Hour	—	65 µg/m^3
	Annual Arithmetic Mean	12 µg/m^3	15 µg/m^3
Carbon Monoxide (CO)	8 Hour	9.0 ppm	9 ppm
	1 Hour	20 ppm	35 ppm
Nitrogen Dioxide (NO2)	Annual Arithmetic Mean	—	0.053 ppm
	1 Hour	0.25 ppm	—
Sulfur Dioxide (SO2)	Annual Arithmetic Mean	—	0.030 ppm
	24 Hour	0.04 ppm	0.14 ppm
	3 Hour	—	0.5 ppm [d]
	1 Hour	0.25 ppm	—
Lead	30 Day Average	1.5 µg/m^3	—
	Calendar Quarter	—	1.5 µg/m^3
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more due to particles when relative humidity is less than 70 percent.	—
Sulfates	24 Hour	25 µg/m^3	—
Hydrogen Sulfide	1 Hour	0.03 ppm	—
Vinyl Chloride	24 Hour	0.01 ppm	—

[a] California standards for ozone, carbon monoxide, sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM_{10}, $PM_{2.5}$, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded.

[b] National standards (other than particulate matter, 8-hour ozone, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The 8-hour ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM-10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For PM-2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

[c] ppm = parts per million by volume; µg/m^3 = micrograms per cubic meter.

[d] Standard listed is the Federal Secondary Standard. No Federal Primary Standard has been established.

SOURCE: California Air Resources Board, State and Federal Air Quality Standards, 2004. Internet Address: http://www.arb.ca.gov/aqs/aaqs2.pdf

expected to achieve air quality standards by the end of 1994. The most stringent requirements were set for areas that could not achieve the standards until after 1997. The Placer County Air Pollution Control District (APCD) worked with Sacramento County APCD to develop a compliance plan and schedule for ozone attainment (state and federal attainment). This plan is the Sacramento Federal Non-Attainment (SFNA) Plan of 1994. The project site is within the SFNA. This plan is the current federal ozone SIP for the Sacramento Federal Ozone Nonattainment Area, and it predicts attainment of the national one-hour ozone standard by 2005 (SMAQMD, 1994). To attain the standard by 2005, the SIP relies heavily on local air district administered stationary source control programs and on statewide mobile source control programs. The most recent update to this plan was issued in 2003 (SMAQMD, 2003) and in general, this update continues to predict attainment by 2005. The Placer County General Plan also puts a heavy emphasis on transportation control measures and coordinated efforts between the county and developers to mitigate sources of significant amounts of emissions. Specifically, the Placer County General Plan air quality Goal 6.F indicates that Placer County will protect and improve air quality in Placer County. Goal 6.G indicates that Placer County will integrate air quality planning with the land use and transportation planning process (Placer County, 1994). The SFNA is designated as a "serious" nonattainment area for the state one-hour ozone standard, designated as nonattainment for the state Ambient Air Quality Standards (AAQS), and an unclassified/attainment area for the national AAQS.

REGULATORY AGENCIES

EPA and CARB regulate mobile emissions sources such as construction equipment, trucks, and automobiles. CARB also oversees the activities of regional and county air districts. The regional and county air districts are primarily responsible for regulating stationary emissions sources and facilities. The Placer County Air Pollution Control District (APCD) regulates air quality through its permit authority over most types of stationary emissions sources in Placer County and through its planning and review activities.

EXISTING AIR QUALITY CONDITIONS

Criteria Air Pollutants

CARB collects ambient air quality data through a network of air monitoring stations in and around Placer County (CARB 2003b). **Table 4.9-2** provides a summary of the air quality data collected from PCAPCD's monitoring sites near the project site over the past five years for those pollutants for which the area is, or has been designated "non-attainment". The table was prepared using data from two monitoring stations in the vicinity of the project area. Ozone and PM-10 data was collected at Rocklin Road station in Rocklin, southeast of the project site.

TABLE 4.9-2
AIR QUALITY DATA SUMMARY (1998-2002) FOR THE PROJECT AREA

		Monitoring Data by Year				
Pollutant	**Standard[a]**	**1998**	**1999**	**2000**	**2001**	**2002**
Ozone:						
Highest 1-Hour Average (ppm) [b]		0.143	0.128	0.118	0.128	0.135
Days over State Standard	0.09	16	17	16	18	21
Days over National 1-Hour Standard	0.12	3	3	0	1	2
8-Hour 3-Year 4th Highest Average (ppm) [b]		0.119	0.111	0.098	0.097	0.111
Days over National 8-Hour Standard	0.08	12	11	12	8	15
Particulate Matter (PM-10):						
Highest 24 Hour Average (µg/m3) [b]		70	75	46	57	36
Days over State Standard	50	1	24	0	12	0
Days over National Standard	150	0	0	0	0	No Data
Highest Annual Average (µg/m3) [b]		19	25	20	21	22
Exceeds State Standard	20	No	Yes	No	Yes	Yes
Exceeds National Standard	50	No	No	No	No	No

a Generally, state and national standards are not to be exceeded more than once per year. See **Table 4.9-1** for additional information.

b ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter.

SOURCE: California Air Resources Board, Pollutant Trend Studies, Rocklin Road Station 1998, 1999, 2000, 2001, 2002; http://www.arb.ca.gov/adam.

Ozone

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the air, but is formed by a photochemical reaction in the atmosphere. Ozone precursors, which include reactive organic gases (ROG) and oxides of nitrogen (NOx), react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem.

Particulate Matter

PM-10 consists of particulate matter that is 10 microns or less in diameter. A micron is one-millionth of a meter. PM-10 represents fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are local in nature, while others, such as vehicular traffic, have a regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility. PM-10 conditions in Placer County are a result of a mix of rural and urban sources, including agricultural activities, industrial emissions, road dust suspended by vehicle traffic, and secondary aerosols formed by reactions in the atmosphere.

Carbon Monoxide

CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when periods of light winds combine with the formation of ground level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures. As a result, CO problems can be localized as a result of high traffic volumes and traffic congestion.

Toxic Air Contaminants

Toxic air contaminants are less pervasive in the urban atmosphere than the criteria air pollutants, but are linked to short-term (acute) or long-term (chronic or carcinogenic) adverse human health effects. There are hundreds of different types of toxic air contaminants, with varying degrees of toxicity. Sources of toxic air contaminants include stationary sources such as industrial processes, commercial operations (e.g., gasoline stations and dry cleaners); and mobile sources such as motor vehicle exhaust.

The approach to regulation of toxic air contaminants from mobile sources has been through establishment (by U.S. EPA and the state Air Resources Board) of emissions standards for motor vehicles (imposed on vehicle manufacturers) and through specifications for gasoline and diesel fuel sold in California (imposed on fuel refineries and retailers), rather than through air quality permits or regulations on how motor vehicles are used by the general public.

Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. Greater sensitivity stems from conditions that include pre-existing health problems or duration of exposure to pollutants. Schools, hospitals and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people and the infirm are more susceptible to respiratory infections and other air quality-related health problems than the general public. Residential areas are also sensitive to poor air quality because people usually stay home for extended periods of time.

There are no sensitive receptors within a mile of the proposed project. The nearest existing residential communities are in north Roseville, west Rocklin, and south Lincoln. Proposals filed with the county include residential neighborhoods and schools to be located to the south west of the connector road. These plans are for future development and would not be impacted by the temporary activities associated with road construction.

4.9.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The following criteria have been used in this section to evaluate potential environmental impacts. An impact would be considered significant if it:

- Conflicts or obstructs implementation of the applicable air quality plan;
- Violates any air district rule, air quality standard or causes a substantial contribution to an existing or projected air quality violation;
- Results in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Exposes sensitive receptors to substantial pollutant concentrations; or
- Creates objectionable odors affecting a substantial number of people.

SIGNIFICANCE THRESHOLDS

For evaluating project impacts, the PCAPCD uses a significance threshold of 82 pounds per day for ROG, NOx and PM-10 and a carbon monoxide threshold of 550 pounds per day (Vintz, 2004a). In addition, any criteria air pollutant emissions that would cause a localized exceedance of state or federal ambient air

quality standards would be considered to have a significant impact. Therefore, operational impacts for carbon monoxide are considered significant if CO 'hot spots' exceeding state or national standards are generated near major thoroughfares and congested surface streets.

METHODOLOGY

Project-related air quality impacts fall into two categories: short-term impacts due to construction, and long-term impacts due to project operation. Short-term construction activities would primarily result in the generation of PM-10 containing fugitive dust. Operation of the roadway should not generate any additional emissions, since the net traffic generation would not change. Additionally, reduction of traffic congestion in the area could result in an overall reduction in operational emissions.

Short-term construction emissions were determined using the SMAQMD's Roadway Construction Emissions Model (SMAQMD, 2003). Construction assumed a worst case scenario disturbance of 11 acres per day. Construction equipment requirements were provided by the contractor (Richards, 2004). An existing source for soil has been identified approximately two miles from the proposed project, reducing the distance for hauling soil to 5 miles per round-trip. All other inputs emission model inputs were left at the default level. The emission model output is included as **Appendix I**.

The SMAQMD roadway emission model does not provide a means to evaluate effectiveness of emission mitigation practices. Therefore some assumptions about mitigation efficiency were made. NOx mitigation efficiency is based on the PCAPCD standard mitigation language requiring a 30% reduction of NOx. PM-10 mitigation effectiveness was determined using the default reductions from the URBEMIS2002 model (Jones and Stokes, 2003). In URBEMIS, mitigation effectiveness for ROG and CO for road and off road diesel engines ranges from 0 to 90%, depending on the technology used. Because the emissions control technology to be used has not been determined and may change depending on the model year of the vehicle, an ROG and CO mitigation effectiveness was assumed to be 0%. In actuality, mitigation measures used to control NOx also typically reduce ROG and CO emissions. Therefore, the ROG and CO emissions listed in the table are overestimated.

Comments received on the Notice of Preparation pertaining to air quality concerns are addressed in the section below. Appendix A includes the Notice of Preparation and comment letters received as a result.

Impact

4.9.1 Construction of the roadway will generally reduce traffic congestion in the area, particularly at the Athens Avenue / Industrial Avenue intersection. It will also provide an unobstructed route across the railroad tracks. With the project, fewer vehicles will have to idle for passing trains at the Athens Avenue railroad track crossing. The project will therefore generally reduce traffic congestion and therefore would reduce emissions of carbon monoxide, PM^{10}, NOX, and ROG.

Mitigation

This is a beneficial impact. No mitigation is required.

TABLE 4.9-3
CONSTRUCTION EMISSIONS WITHOUT MITIGATION (POUNDS PER DAY)

Pollutant	Unmitigated Emissions	Mitigation Effectiveness	Mitigated Emissions	Significance Thresholds
ROG	33	0%	33	82
NOx	230	30%	161	82
PM-10	67	80%	13.4	82
CO	190	0%	190	550

Source: URBEMIS 2002 Model
Note: Values in bold are in excess of applicable significance thresholds.

Impact

4.9.2 Construction emissions could result in significant quantities of particulate matter (PM-10 concentrations) and NOx on a temporary and intermittent basis during the construction period. This is a significant impact.

The project would be constructed over a period of approximately 6 months, and over the course of that period the entire site would be subject to grading and development. Project construction could generate dust (including PM-10) primarily from "fugitive" sources (i.e., emissions released through means other than through a stack or tailpipe) and other criteria air pollutants primarily from operation of heavy equipment construction machinery (primarily diesel operated) and construction worker automobile trips (primarily gasoline operated).

Construction-related dust emissions would vary from day to day, depending on the level and type of activity, silt content of the soil, and the weather. Combustion emissions from heavy equipment and construction worker commute trips would also vary from day to day, and would contribute incrementally to regional ozone concentrations over the roughly 10-month construction period.

An analysis was conducted for the proposed project to determine the levels of emissions from the proposed project. Construction emissions during construction were estimated using the SMAQMD's Road Construction Emissions Model. Results are summarized in **Table 4.9-3**.

The emission model indicates that PM-10 emissions will be approximately 67 pounds per day without mitigation. This is below the PCAPCD threshold of significance of 82 pounds per day. However, dust mitigation will be required to ensure compliance with the PCAPCD visibility and nuisance dust rules. ROG and CO emissions were also less than the significance threshold at 33 and 190 pounds per day respectively.

While PM-10, ROG and CO emissions will be minor, NOx emissions are anticipated to exceed significance thresholds. **Table 4.9-3** shows that NOx emissions from construction equipment would be approximately 230 pounds per day. With mitigation (described below) NOx emissions could feasibly be reduced to 161 pounds per day, which still exceeds the Placer County Thresholds of Significance of 82 pounds per day.

Mitigation Measure

4.9.2 The construction contractor shall be required to implement the following construction-related measures to reduce emissions of PM-10 and NOx emissions below the significance thresholds, and to reduce the potential for substantial nuisance or visibility impacts in the immediate vicinity of the project site.

- Enclose, cover or water all soil piles as needed;
- Water all exposed soil with adequate frequency to keep soil moist at all times;
- Water all haul roads twice daily or more frequently as needed;
- Sweep (with water sweepers) paved streets adjacent to the project construction site as needed to remove accumulated dust;
- Ensure that all mobile and stationary internal combustion engine equipment is properly maintained and well-tuned according to manufacturer's specifications.
- Minimize idling time to 5 minutes for all diesel powered equipments.
- Submit to the PCAPCD a comprehensive inventory (i.e. make, model, year, emission rating) of all the heavy-duty off-road equipment (50 horsepower or greater) that will be used an aggregate of 40 or more hours for the construction project. The inventory shall be updated and submitted monthly throughout the duration of the project, except that an inventory shall not be required for any 30-day period in which no construction activity occurs. At least 48 hours prior to the use of subject heavy-duty off-road equipment, the project representative shall provide the PCAPCD with the anticipated construction timeline including start date, and name and phone number of the project manager and on-site foreman.
- Provide a plan for approval by the PCAPCD demonstrating that the heavy-duty (> 50 horsepower) off-road vehicles to be used in the construction project, including owned, leased and subcontractor vehicles, will achieve a project wide fleet-average 30 percent NOx reduction and 45 percent particulate reduction compared to the most recent CARB fleet average. Options for reducing emissions may include use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, and/or other options as they become available.
- The applicant shall submit to the District and receive approval of a Construction Emission/Dust Control Plan prior to groundbreaking.
- Construction equipment exhaust emissions shall not exceed District Rule 202 Visible Emission limitations.
- No open burning of removed vegetation during infrastructure improvements. Vegetative material should be chipped or delivered to waste to energy facilities.

- Clean earth moving construction equipment with water once per day.
- An operational water truck shall be onsite at all times. Apply water to control dust as required per District Rule 228.
- Suspend all grading operations when fugitive dusts exceed District Rule 228 Fugitive Dust limitations.
- Reduce traffic speeds on all unpaved surfaces to 15 miles per hour or less.
- Use low sulfur fuel for stationary construction equipment.

Unmitigated ROG and CO emissions will be below the thresholds of significance. PM-10 emission will be below the threshold of significance, but mitigation is still required to ensure that local air quality visibility and nuisance regulations are not violated. All feasible NOx mitigation measures recommended by the PCAPCD (Vintz, 2004b) are implemented. However, NOx emissions would continue to be above the significance threshold. Although construction emissions would be above thresholds of significance for NOx emissions, this would be a temporary impact lasting the length of the construction period.

Significance after Mitigation

Significant and unavoidable. Construction of the proposed project would generate combustion emissions (NOx) that would contribute to regional ozone concentrations during the construction period. This is consistent with the findings of the Sunset Industrial Area Plan EIR, which concluded that construction of individual developments would temporarily increase criteria air pollutant emissions and that these impacts would be significant and unavoidable.

Impact

4.9.3 Persons traveling along the roadway could be exposed to toxic air contaminants from sources in the Sunset Industrial Area. This would be a less than significant impact.

Operation of the proposed project would not itself contribute or generate additional toxic air contaminants above current levels. However, several existing facilities in the area are known to handle, store, and use bulk quantities of hazardous materials, including formaldehyde, considered a probable human carcinogen. The location of these hazardous materials and possible routine airborne emissions is generally centered around the Cincinnati Avenue Area. The PCAPCD, through its AB 2588 permitting authority, has classified several of these facilities as high priority facilities but has only required the Formica Company, located at 3500 Cincinnati Avenue, and the Western Sanitary Regional Landfill to prepare Health Risk Assessments. Under normal operating conditions, these facilities emissions do not pose a health risk to persons traveling through the area.

Mitigation Measure

No mitigation is required.